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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,180	10/15/2003	Lionell K. Griffith	7171-10910207852	7586
167	7590	05/25/2005	EXAMINER	
FULBRIGHT AND JAWORSKI L L P			KAO, CHIH CHENG G	
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LOS ANGELES, CA 900172576			2882	

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/687,180

Applicant(s)

GRIFFITH, LIONELL K.

Examiner

Chih-Cheng Glen Kao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-14, 21-28 and 35-42 is/are allowed.
- 6) ☒ Claim(s) 1-6, 15-20 and 29-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 5, 15-17, 19, 29-31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swift (US Patent 4472822) in view of Schwarz (US Patent 6400791).
2. Regarding claims 1, 15, and 29, Swift discloses a digitized tomosynthesis method, system, and apparatus (title) for obtaining an image of an object (fig. 3, "object") in which a ray of energy from a source (fig. 5, "x-ray source") travels through the object to impinge on an energy sensor (fig. 5, "detector") defining an image plane and in which the object is rotated about an axis (fig. 5, "axis of rotation") whereby an image is acquired by the energy sensor at successive rotational positions of the object (abstract), wherein the object is rotated about an axis of rotation (fig. 5, "axis of rotation") at an angle with respect to the image plane (fig. 5, "detector").

However, Swift does not disclose obtaining a 3D volumetric image and an axis of the object at a canted angle to an image plane.

Schwarz teaches a 3D volumetric image (col. 3, lines 54-56) and an axis of the object (fig. 3, axis defined by #7) at a canted angle to an image plane (fig. 3, #5).

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It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift with the 3D volumetric imaging and canted angle of Schwarz, since one would be motivated to make such a modification to better display objects whose center axis is inclined toward the center axis of the patient support (col. 1, lines 15-20) as shown by Schwarz.

3. Regarding claims 2, 3, 16, 17, 30, and 31, Swift further discloses x-ray radiation (title).
4. Regarding claims 5, 19, and 33, Swift further discloses the optical axis of the source (figs. 3 and 5, #11) perpendicular to the image plane (figs. 3 and 5, #18).
5. Claims 4, 18, and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Swift and Schwarz as applied to claims 1, 15, and 29 above, and further in view of Hsieh (US Patent 6226350).

Swift as modified above suggests a method, system, and apparatus as recited above.

However, Swift does not disclose a flat panel digital detector.

Hsieh teaches a flat panel digital detector (col. 2, lines 27-31).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift as modified above with the detector of Hsieh, since one would be motivated to make such a modification to obtain projection data faster (col. 2, lines 27-31) as implied from Hsieh.

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6. Claims 6, 20, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swift and Schwarz as applied to claim 1, 15, and 29 above, and further in view of Besson et al. (US Patent 6301325) and Feldkamp et al. ("Practical cone-beam algorithm").

Swift as modified above suggests a method, system, and apparatus as recited above.

However, Swift does not specifically disclose mathematically tracing a ray of energy through a voxel, computing a coordinate of a shadow of the voxel on the image plane, and extracting and combining image data to form the object space voxel.

Besson et al. teaches computing a coordinate of a shadow of the voxel on the image plane (col. 5, lines 62-64) and extracting and combining image data to form the object space voxel (col. 1, lines 31-34). Feldkamp et al. teaches mathematically tracing a ray of energy through a voxel (fig. 4, line from source through "Y").

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift as modified above with the calculated voxel image of Besson et al., since one would be motivated to make such a modification to better determine the make up of the patient through which rays traverse (col. 1, lines 23-26) as implied from Besson et al.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the method, system, and apparatus of Swift as modified above with the mathematical tracing of Feldkamp et al., since one would be motivated to make such a modification to perform reconstructions faster (page 612, col. 2, lines 16-18) as shown by Feldkamp et al.

***Allowable Subject Matter***

7. Claims 7-14, 21-28, and 35-42 contain allowable subject matter.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 7, 21, and 35, prior art does not disclose or fairly suggest a method, system, or apparatus including determining an axis of rotation of an object and comparing locations of first and second shadow images to determine source and object angles relative to an energy sensor, in combination with all the limitations in each respective claim. Claims 8-14, 22-28, and 36-42 contain allowable subject matter by virtue of their dependency.

***Response to Arguments***

8. Objections to the claims in the Office Action mailed 2/22/05 have been withdrawn in light of the Amendment filed 5/4/05.

9. Applicant's arguments filed 5/4/05 have been fully considered but they are not persuasive.

Regarding Applicant's arguments, the Examiner is not contending that one could substitute Schwarz's patient support mechanism for Swift's rotary support. The Examiner is contending that one having ordinary skill in the art would find obvious the modification to tilt the x-ray source and detector at a canted angle with respect to the axis of the object for inspection (figs. 1-3), which one would be motivated to do to better display objects whose center axis is inclined toward the center axis of the patient support (col. 1, lines 15-20) as shown by Schwarz.

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In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper.

Therefore, Applicant's arguments are not persuasive, and the claims remain rejected.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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